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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,703	07/06/2004	Jun-ya Ishizaki	SUG-181-PCT	7186

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EXAMINER

QUINTO, KEVIN V

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/500,703

Applicant(s)

ISHIZAKI, JUN-YA

Examiner

Kevin Quinto

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11, 12, 21, 22, 24, 25, 27 and 29 is/are allowed.
- 6) ☒ Claim(s) 1, 6-10, 13-18, 23, 26 and 28 is/are rejected.
- 7) ☒ Claim(s) 2-5, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6 July 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is further objected to because of the following informalities: the specification contains language which contradicts the rest of the disclosure. On p. 23, lines 8-11, the applicant states, "As is known from the above, the buffer layer of the Zn-base semiconductor light emitting device of this invention comprises a polycrystal layer or an amorphous layer after being crystallized." However this does not appear to conform with the rest of the specification which goes into detail about how the buffer layer is amorphous and is then crystallized by annealing (p. 12, lines 1-25 and p. 13, lines 1-18 of the currently filed specification).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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5. Claim 18 describes a buffer layer which is "an amorphous layer after crystallization." Furthermore in the currently filed specification, on p. 23, lines 8-11, similar language is used. However this does not appear to conform with the rest of the specification which goes into detail about how the buffer layer is amorphous and is then crystallized by annealing (p. 12, lines 1-25 and p. 13, lines 1-18 of the currently filed specification). Therefore the metes and bounds of this claim are indefinite.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 6, 7, 9, 10, 13, 15, 16, 17, 18, 26, and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Sano et al. (USPN 6,664,565 B1).

8. In reference to claim 1, by Sano et al. (USPN 6,664,565 B1, hereinafter referred to as the "Sano" reference) discloses a fabrication method which meets the claim.

Figure 6 of Sano illustrates a Zn-base semiconductor light emitting device. A buffer layer (305) of a Zn-base compound is formed on the substrate (301). The substrate (301) does not contain the Zn-base compound. A light-emitting region is composed of a Zn-base compound (311, 315) and is formed on the buffer layer (305). The buffer layer

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(305) is disclosed as being an amorphous layer which is annealed before the light emitting stack is formed (column 3, lines 11-67, column 4, lines 1-67, column 5, lines 1-21).

9. In reference to claim 6, Sano discloses that the annealing temperature is set higher than the formation temperature of the stack (column 4, lines 27-35).

10. With regard to claim 7, the substrate is made of sapphire (column 6, lines 59-61).

11. In reference to claim 9, the buffer layer (305) is made of zinc oxide (column 6, lines 59-61).

12. In reference to claim 10, by Sano (USPN 6,664,565 B1) discloses a fabrication method which meets the claim. Figure 6 of Sano illustrates a Zn-base semiconductor light emitting device. A buffer layer (305) of a Zn-base compound is formed on the substrate (301). The substrate (301) does not contain the Zn-base compound. A light-emitting region is composed of a Zn-base compound (311, 315) and is formed on the buffer layer (305). The buffer layer (305) is disclosed as being an amorphous layer which is annealed before the light emitting stack is formed (column 3, lines 11-67, column 4, lines 1-67, column 5, lines 1-21). The formation temperature for the buffer layer is lower than the formation temperature of the light emitting region (column 6, lines 5-13). Sano discloses that the annealing temperature (column 5, lines 35-40) can be higher than the formation temperature of the stack (column 6, lines 16-19).

13. With regard to claim 13, the buffer layer (305) is made of zinc oxide (column 6, lines 59-61).

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14. In reference to claim 15, Sano discloses forming the light emitting region (315) at a temperature range of 600°C to about 800°C (column 6, lines 16-19) thereby meeting the claim.

15. With regard to claim 16, the annealing atmosphere is an oxygen-containing atmosphere (column 3, lines 36-67, and column 4, lines 1-57).

16. With regard to claim 17, Sano discloses that the buffer layer (305) is 100 nm or 0.10 μm thereby meeting the claim.

17. So far as understood in claim 18, Sano (USPN 6,664,565 B1) discloses a device which meets the claim. Figure 6 of Sano illustrates a Zn-base semiconductor light emitting device. A buffer layer (305) of a Zn-base compound is formed on the substrate (301). The substrate (301) does not contain the Zn-base compound. A light-emitting region is composed of a Zn-base compound (311, 315) and is formed on the buffer layer (305). The buffer layer (305) is disclosed as being an amorphous layer which is annealed before the light emitting stack is formed (column 3, lines 11-67, column 4, lines 1-67, column 5, lines 1-21).

18. With regard to claim 26, the annealing atmosphere is an oxygen-containing atmosphere (column 3, lines 36-67, and column 4, lines 1-57).

19. With regard to claim 28, Sano discloses that the buffer layer (305) is 100 nm or 0.10 μm thereby meeting the claim.

Claim Rejections - 35 USC § 103

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20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sano et al. (USPN 6,664,565 B1) in view of Ogiwara et al. (JP 07-058360).

22. In reference to claim 8, Sano does not disclose the use of a glass substrate to form the light emitting device. However the use of glass substrates to support light emitting devices is well known in the art. Ogiwara et al. (JP 07-058360) discloses a light emitting device which is formed on a low cost glass substrate which has the benefit of a lower cost in production (abstract). In view of Ogiwara, it would therefore be obvious to implement a glass substrate in the fabrication process of Sano.

23. Claims 14 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano et al. (USPN 6,664,565 B1).

24. With regard to claim 14, Sano discloses forming the buffer layer (305) at a temperature range of 100°C to about 400°C (column 3, lines 13-15 and column 6, lines 59-60). The examiner would like to note:

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05.

Thus claim 14 does not distinguish over the prior art reference of Sano.

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25. With regard to claim 23, Sano discloses forming the buffer layer (305) at a temperature range of 100°C to about 400°C (column 3, lines 13-15 and column 6, lines 59-60). The examiner would like to note:

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05.

Thus claim 23 does not distinguish over the prior art reference of Sano.

Allowable Subject Matter

26. Claims 11, 12, 21, 22, 24, 25, 27, and 29 are allowed.

27. Claims 2, 3, 4, 5, 19, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

28. The following is a statement of reasons for the indication of allowable subject matter: the examiner is unaware of any prior art which suggests or renders obvious a fabrication method for a Zn-base semiconductor light-emitting device which utilizes a Zn-base compound buffer layer that is formed at a temperature lower than the formation temperature of the light emitting region, annealed before the light emitting region is formed at a first temperature which is between the formation temperature of the buffer layer and the formation temperature of the light emitting region and is then annealed at a second temperature which is greater than the formation temperature of the light emitting region.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571) 272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KVQ